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☞See advertisement on last page.

Poetry.

DEPARTING AFFECTIONS.

BY R. BARTHOLOMEW.

When this head is sleeping
'Neath the willow tree,
Will no one be weeping,
Sad, there for me?
When balmy breezes glad,
Shake the golden corn,
Will no one mourning sad,
Come there at morn?
Will all the love and sorrow,
Smiles and happy hours,
Lie in my lonely barrow,
Like faded flowers?
Will hopes of youthful days,
Bright as summer sky,
Tales of love and lovers lays,
Unremembered die?

Oh no! one will come
Soft as the flower
Scenting the desert lone
After the shower,
And o'er my lowly tomb.
Like hopes and fears,
Wild flowers will sweetly bloom
Gemm'd with her tears,
Fragrant as summer gale,
Kissing the lea,
Soft as a seraph's tale,
Thy love's for me,
Oh who can read our love,
What tongue can tell?
Mary we'll meet above—
Loved one, farewell!

A MOTHER'S BLESSING.

BY E. M. MOUNTAIN.

Mother! send me but thy blessing—
'Tis the gift I highest prize;
Other Gems may go amissing—
This—O! this is in the skies,
Like the iris bright to cheer me,
When the floods of sorrow roll—
Like the summer shower when weary,
Shedding freshness to my soul!

I can raise my face to heaven,
Think that I have treasures there—
The promise that my God hath given
To a mother's fervent prayer;
And that promise and that blessing
Never, never can deceive—
Other gifts may go amissing,
These attend me while I live.

NATURE.

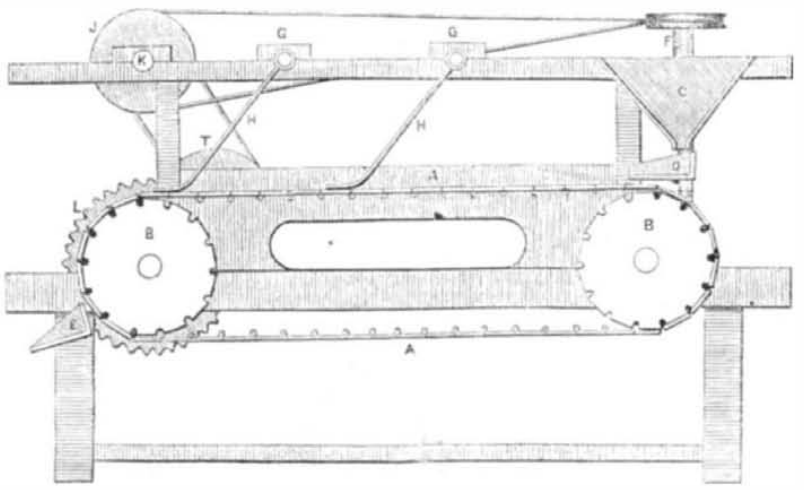
From the noise and the tumult
I've hied me away,
To spend in the forest
The warm sultry day.

The waters that ripple
So joyous along,
With the birds and the breezes,
Make eloquent song.

O, come and sit with me,
My dearest, my own;
And list to sweet music
As ever was known.

Misunderstanding and inattention create more uneasiness in the world than deception and artifice.

J. MASSEY'S IMPROVED GRAIN DRYER.



The above cut is a longitudinal section view of an improvement in a Grain Dryer, invented by Mr. John Massy, of Providence, R. I The principal feature of the invention consists in providing a flexible iron-plate endless web on which the grain is to be dried as it revolves in a kiln heated economically by double flues running under the endless iron web.

A, is the endless iron-plate web. It is formed of a number of plates of sheet or cast iron and united together like a common hinge. It may in fact be called a *broad hinge band.* This web receives the grain from a hopper C, conveyed down through a spout D. The web is revolved by a band and pulley driving the rollers B B. These rollers are of cast iron having grooves cast in them for the barrels of the hinges of the plates of A, to mesh into. The surface of these rollers as will be observed, is not perfectly circular but of such shape as to accommodate them to the plates of the web. This combination of the rollers and web is a new feature in a Grain Dryer. The apparatus is made of iron, cast or wrought as the case may be. The grain is confined on the face of the web by a kind of wedge side or rim, and it is shifted on the web so as to dry it thoroughly and equally by rakes H H, which traverse from side to side accross the web stirring and shifting the grain. This is done in the following manner. On the other side of the frame placed longitudinally, is a rocking shaft to which are attached the shafts G G, across the web, that shifts the grain.—This rocking shaft is not seen in the engraving, but is driven by a crank, attached by a flexible connecting rod with K, on which is fixed another crank placed at right angles with the crank on the end of the rocking shaft.

Operation.—From the pulley F, passes a cord around the pulley J, which operates the rakes as described. From J, over T, another grooved pulley, there is another band fordriving said pulley T. On the axis of this latter pulley there is a rack into which meshes the cogs of L, a cog wheel, so that when T is revolved, it also operates the cog wheel which is fixed upon the axle of B, and thus the endless web is driven. It will readily be observed, that if a drum was fixed upon the axle of B, instead of the cog wheel L, a band from J, passing around said drum would drive the web and dispense altogether with T, and the rack and cog wheel entirely. The hopper C, is operated by a crank on F, not seen in the engraving, but which works it like all other hoppers. The hinge plate web is far superior to wire gauze for drying the grain. In fact wire gauze presents a cooling, not a radiating surface. We would suppose that this kind of endless web might be adapted by machinery for biscuit and cracker baking, carrying the crackers or biscuit through some ingeniously constructed opening to an oven and thus finishing them at a single operation, letting them drop down on a table perfectly baked. By an arrangement of this kind the dough would never need to be touched from the moment it was entered upon the apron or feed table into the pressing rollers. Look what a saving of labor this would be. We have no doubt but some application of this kind will yet be effected.

Mr. Massy has taken measures to secure a patent.

Effects of Cannon Balls on Iron Steamers.

At Portsmouth some remarkable results have been produced by the experimental shot practice, from the Excellent, on the iron steamer Ruby, and it is expected the Admiralty will, in consequence, stop the building of iron Steamers aud other vessels for the present. The shots which hit the Ruby not only penetrated the side first struck, but in some instances passed through the other side carrying with it whole plates of iron. In action this would risk the total loss of the vessel, for on heeling over to leeward, such a body of water must rush in, that nothing could prevent her sinking, with all on board. A representation of this important circumstance arising from the recent trials, has been made to the Admiralty, and should further experimental firing prove that serious risk will be occasioned to iron vessels of war when exposed to the chance of being struck by heavy shot, it is doubtful if the board will not abolish them as men of war

Power of Eloquence.

The eloquence of the celebrated Whitfield, it is said, was at times irresistable. The accomplished skeptic Chesterfield, was present when this popular preacher presented the votary of sin under the figure of a blind beggar, led by a little dog. The dog had broken his string. The blind cripple, with his staff between both hands, grouped his way unconscious to the side of a precipice. As he felt along with his staff, it dropped down the descent too deep to send back an echo. He thought it on the ground, and bending forward took one careful step to recover it. but he trod on vacancy, poised a moment and he fell headlong.—Chesterfield sprang from his seat exclaiming, "By heaven he is gone."

Explosion.

The steamer Magdalen, built in New York and intended for the Grenada and Carthagena trade, burst her boilers on her passage out, killing Capt. Beekman, of the steamer Grenada, and 9 others. The boat was blown to atoms.

RAIL ROAD NEWS.

Ohio will soon be threaded with railroads which is both an evidence of her increasing riches and civilization. There are but fourteen miles of staging now between Cincinnati and Lake Erie. The cars are now running from Urbana to Sandusky City.

A Railroad is projected between Charleston S. C. and Savannah, Geo. These two important Southern Cities are to be connected by railroad with Nashville, Tenn.

The directors of the Hudson River Railroad have called for a fifth instalment of $10 per share on the capital stock.

The directors of the Great Western Railroad on the Canada side, are busily engaged in procuring the funds for the full completion of that important Railroad.

Montreal Telegraph.

The important work of stretching the wire across the St. Lawrence, at a point near the *Chute* of the Lachine Rapids, for the Troy and Montreal Telegraph, is now fast progressing toward completion. From the East shore to Alsopp's Island, is 3,200 feet, and from this Island to the West or Montreal shore. 3,190. A pier will be built on a small island now submerged in water, between Alsopp's island and the East, or Laprarie shore, on which will be erected a strong and high scaffolding, supporting a mast, projecting from the top to 150 feet from the ground. Two other masts, one on the East side of Alsopp's Island, will be of the same height, and that on the West shore, 120 feet, including piers, &c. The most difficult work, and that requiring the utmost skill, will be to stretch the wire across the current; where the rapids exceed in dangers and difficulties, any other part of the St. Lawrence.

Lucky Dream.

The forms of small shot used by sportsmen are exactly spherical. The manner in which this advantage is secured, is ingenious. It is said that a Mr. Watt, a native of Bristol, and a plumber by trade, had a dream, in which he saw the whole contrivance. A person appeared before him on the top of a high tower, with a sieve in one hand, and a ladle of melted lead in the other, the lead was pou red into the sieve, which he shook violently and the liquid metal fell in drops, like rain to the floor of the tower, but in its fall had recovered its solidified state.—The imaginary person then descended, from the tower and examined some of the shot, and among them Watt saw several that were not either perfectly round or had tails to them. To separate these from the others, the man removed the shot to an inclined plane. Those that were round ran down the plane, while those that were misshapen wriggled over the side. A perfect separation was thus effected. This was a lucky dream for Watt, as he sold his patent for £10,000, and a similar method is still employed by manufacturers.

Tea in France.

The *Journal des Debats* states, that the experiments made for introducing the culture of the tea plant in France have fully succeeded, the climate, in the coldest part of the country, being fully adapted to it. The experiments made in Algeria have not been so successful; all the plants were killed by the heat notwithstanding every precaution.

Screw and Paddle.

Two war steamers, the Rattler and Alecto, the one a screw and the other a paddle steamer, were lashed together stern to stern recently in England and both their engines put to their full speed, when it was found that the screw towed the paddle steamer backwards.

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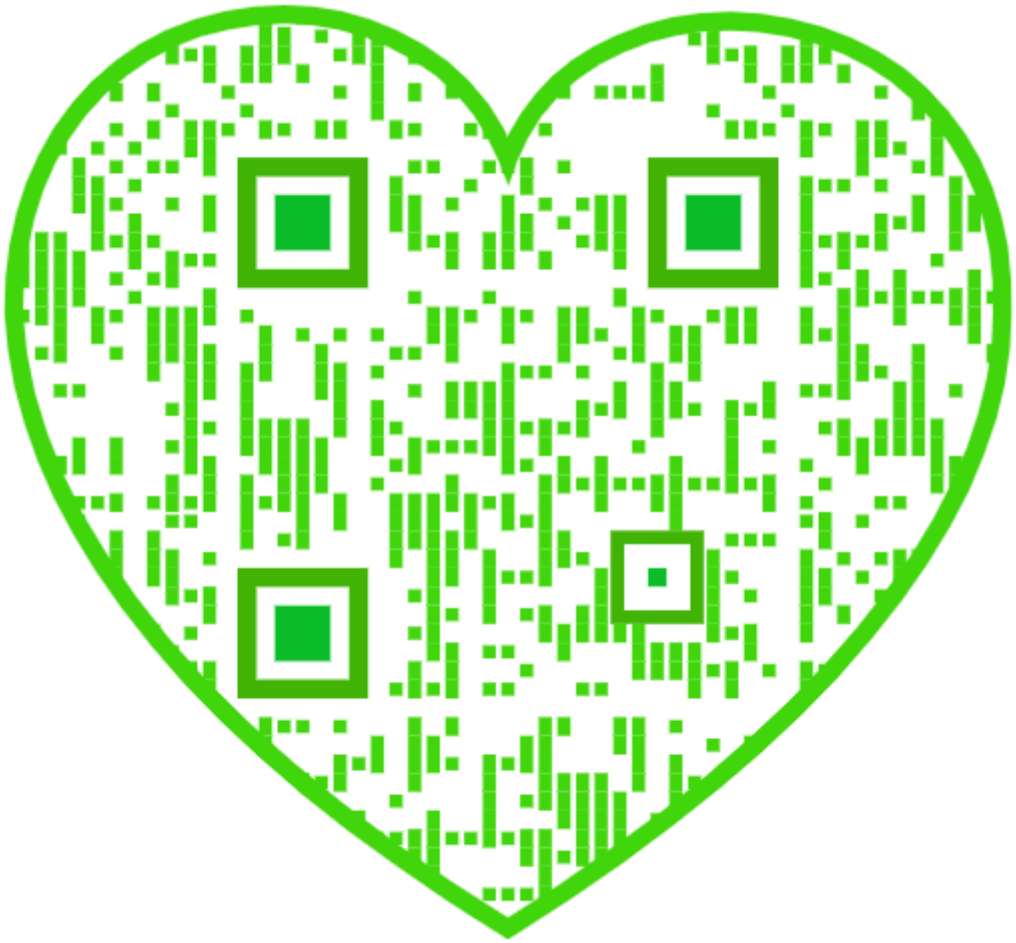

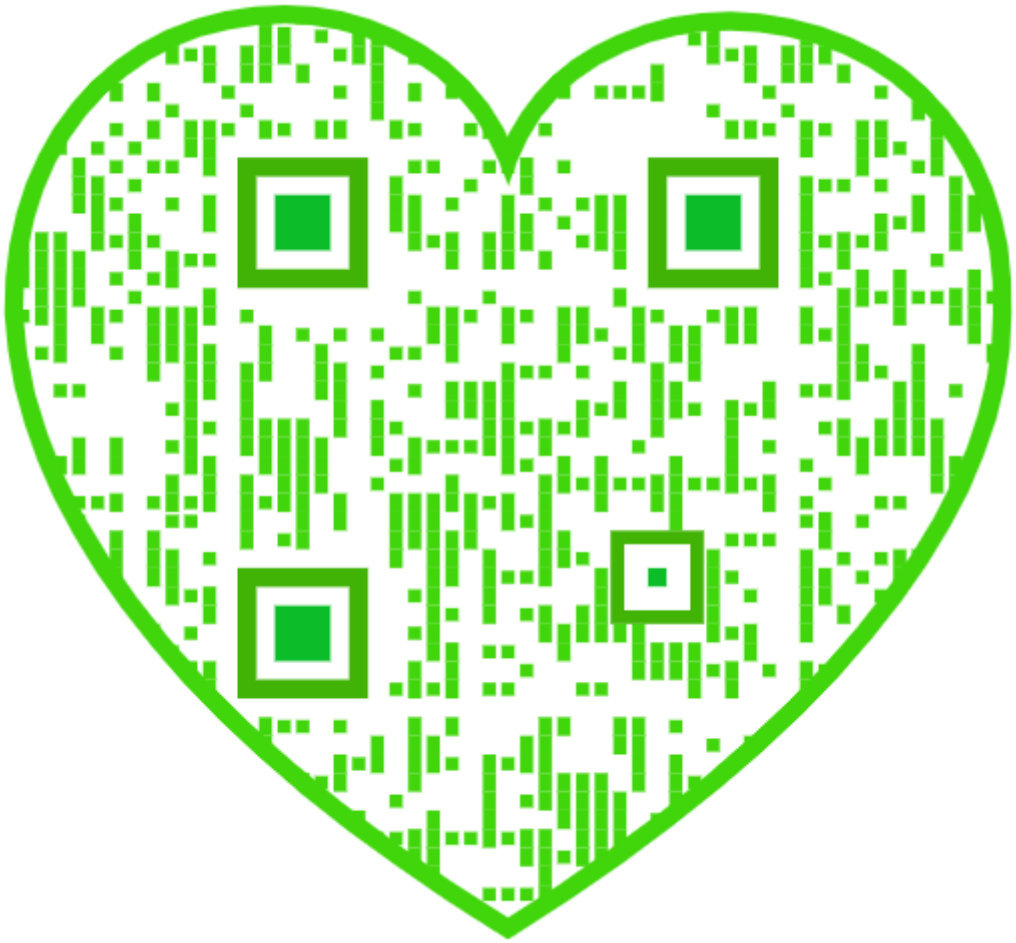

Late Foreign News.

The late news from Europe give indications of a universal war, yet it is to be hoped that the similarity of events in Europe at the present moment to those of the old Revolution of Paris will not be attended with the same results. If there is one man who can weather the storm, it is Lamartine. With more than the eloquence of Mirabeau, he possesses a spotless character, and a conscious integrity. This moral courage of the man elevates him in the eyes even of those who look upon all revolutionary movements with alarm and distrust. The great fear we have is for Germany. We cannot shake the conviction from our mind that the Russian Bear will yet enter the field of contest and forcibly take possession of the fairest portion of the German Empire. There is every appearance of this in the meantime. In England the excitement among the Chartists is intense, yet no more than it was in 1839. The end of all we are afraid will be the shedding of much blood and the suffering of many innocent people. It is a sad thing to reflect upon the cruelty and brutishness of man. He is more cruel than any other animal, for while the beast of the forest kills to satisfy his hunger, man destroys his fellow man often in mere wantonness—seldom from necessity. The next steamer must bring most important news, and we are led to predict that if the people of Great Britain and the army have come into collision since the Acadia left Liverpool, that the people will have suffered. Our opinion is based upon the general want of discipline in the British people in comparison with the French !

The Cast Iron Plough.

At a meeting of the Farmer's Club, held in this city last week, Mr. Nicholas Lands, of N. J. a venerable farmer, confirmed all that we have already stated in regard to the inventor of the *Cast Iron Plough*. He stated that the first cast iron plough which he saw was in 1800, in this city and it was manufactured by Charles Newbold and sold for $10. It was cast all in one piece, mould board and share together. This was an evil in them as they sometimes broke and were difficult to repair If any man should have been rewarded for his invention, it was Mr. Newbold, but he was unfortunate, and alas, died insolvent and in a madhouse—the fate of not a few poor inventors. The first cast iron mould board was invented in 1740 by James Small, of Berwickshire, Scotland, and was good. Mr. Sands stated to the Club that he had found one of the ploughs before mentioned, in Orange county, and brought it to this city, depositing it in the well known Agricultural Warehouse of Mr. Allen, by whom it was again pronounced an excellent model, and, on trial, made perfect work. Mr. Sands thought the model now in use varies very little from the first invention of Mr. Newbold. Jethro Wood, Mr. S. observed, got *his* patent because he had represented he had discovered an improvement on the share—a new combination of the parts ; but at last he came back to Mr. Newbold's original plan.

Singular and Successful Operation.

When Barnard says a Buffalo paper, a young man, was stabbed in a fracas, not long since, Dr. E. K. Chamberlin, "Old Medicine," was sent for. Upon his arrival, and on examination of the wound, he found that a portion of of the lungs was protruding some two inches from the wound, it having been forced out probably by respiration. As the case was a critical one, and requiring immediate operation, the Doctor resorted to a new method of treatment. The end of the protruding lung which had been injured by the shot, was bound with silk thread, and the injured end *cut entirely off*, and the remainder forced back into its natural location. Barnard is now in the enjoyment of good health. The Doctor has the amputated lung now in his possession.

Important Invention.

The Fire and Burglars Alarm, invented by Messrs. Tomlinson & Hopkins, and which was represented in No. 13, Vol. 3 Scientific American, we understand is creating quite an interest among our citizens, and there is a prospect that the inventors will reap the reward which their invention merits. There has been a large number of their machines put up in Boston, and a correspondent informs us that they give perfect satisfaction. The apparatus is very neat, and rather ornamental to a room than otherwise. It is not liable to get out of repair and so simple in its construction that a child can manage it. One of the machines is at present at our office where its merits can be tested by any who feel disposed to call and see it.

We have been appointed agents for the sale of rights and are now prepared to make arrangements for the sale of any part of the United States, except Boston and its vicinity, which are already disposed of.

To young men who are out of business, and desirous to embark in something profitable, we can recommend this as a favorable opportunity and one requiring but little capital.—Communications addressed to this office, (Post paid,) will receive proper attention.

Subterranean Lake.

On the line of Railroad between Sandusky and Urbana, and near Belfontaine, Ohio, is a small 'round prairie,' containing about 80 acres. The Mud River Railroad was originally laid out and graded across this prairie, but the workmen one morning discovered that a portion of the track had disappeared; large timbers were laid across the 'hole,' and the superstructure again completed, when about six hundred feet of the road dropped down. Again the company sought to build a foundation—the timber upon sixty acres was deposited, in this hole, and more than 10,000 dollars expended, and still the hole was not filled A slight curve around the prairie was then made, at an expense of 1,100 dollars whereon the cars now run.

Across this prairie runs a small stream—the soil is rich, consisting of decayed vegetable matter, some six or eight feet in depth, which is evidently a crust over a small lake; the water under this crust is thirty feet deep and fine fish are found in these subterranean waters. The streams in this Cave are not known to rise and fall with the waters of the Green River, in the vicinity, and is supposed to have a water communication with other lakes in the neighborhood, of which there are several, from the fact, among others, that the same species of fish are found in each.

The Hemp Crop.

The Louisville Democrat says there is but a very small amount of last year's crop remaining in producers hands, and experienced producers are of the opinion that the crop now coming forward will be from one-third to one-half less than last year. The Democrat says—" It is no longer a question whether the American water-rotted hemp is equal to the Russian. The point has been fairly settled by the best tests. The United States agent for this State, Col. Lewis Sanders, is a constant buyer in this market. He purchased a lot of ten tons water rotted, from Fayette county, one day this week, at $205 and $210 per ton.

The Irish way to obtain Heights which cannot be Measured.

In reply to an inquirer, who asks how he can obtain the height of a tower without measuring it, the editor of the Irish Railway Gazette, answers thus :—" Take any two rods of *equal* length, place the *short* rod at any convenient distance from the building, and the long rod at such a distance from it, that looking over the short rod to the top of the building, the top of the long rod shall cut the sight."

The following letter of recommendation is a very disinterested one :—

Sir.—Mr. ———, may be a very good accountant: I know him to be a very clever bookkeeper. I lent him two Shakspeares, three Scotts, and a Boz, eighteen months ago, and he has not thought proper to return one of them. I am, sir, &c. S. B.

Mechanics Look to your Accounts.

Many traders and mechanics are in the habit of making their original charges during the day, on a slate, and having them at night or at some convenient opportunity transcribed on the day book. It is a very unsafe practice. A decision directly in point has been made in the Court of Common Pleas in Boston. In the case of Buckley *vs.* Pilsbury, the defendant offered to make oath to his books of account, in which it appeared that the entries were made once a week or oftener, by his clerk who transcribed them from a slate, on which they were entered by the defendant himself; the clerk not being able to testify to the items charged any further than that they were correctly transcribed. The Court ruled that the defendant could not be permitted to swear to the correctness of his books

A Giant.

There is in England a man named the *Yorkshire Giant*, from his great size, but whose real name is Robert Hales. He is nearly 8 feet in height and weighs 462 lbs. His longitude is inherited from his parents, his father, a farmer, being six feet six inches, and his mother six feet (weighing 196 lbs.) Of this Patagonian couple the progeny were all remarkable for their stature ; the boys were "sons of Anak," and the daughters of Amazonian developement. The four sons averaged six feet five inches in height ; the daughters six feet three and a half inches. But the flower of the flock is the one now spoken of. One of his sisters, aged twenty, attained seven feet two inches and weighed 224 lbs., but she died in 1842. Mr. Hales is now in his 28th year, of fair proportions, with pleasing features and good humored, cheerful countenance. He is vivacious and intelligent, and altogether a very different sort of being to the heavy lumpish louts to be seen in exhibitions. This family confirms in every point the doctrines set forth in "The Constitution of Man."

The Cotton Steamers of the Mississippi.

Those prodigious buildings, the cotton steamers, constitute a remarkable feature upon the Mississippi. The English reader cannot possibly form a more correct idea of their appearance at a distance, than by imagining to himself a "factory," three or four stories high, placed upon a rather ornamental raft, and sent to float upon the water. On a nearer approach, and closer inspection, however, they are found to be splendidly got up, and provided with accommodation (civility and gentlemanly conduct included) to which the traveller by any other than first class British steamers is too often a stranger.—*Colonial Magazine.*

Hanging Machine.

One of our Exchanges says that a Yankee has invented a machine by which culprits can be hung with steam, and the sheriff may be saved the trouble of meddling with the business. He half swung himself to see how it would operate, and declares it "works beautiful,"—all of which we believe but the last sentence, Yankee has too much in his nonce to try such an experiment, even for "fun."

A Hard Head.

A man named Pierre Ramonial was arrested in New Orleans for shooting a man named Virgillio Sellares. After quarrelling some time, the former drew a pistol and shot the other. The ball struck him in the forehead between the two eyes and glancing upwards along the right side of the forehead, travelled right round under the skin, and came out at the back of the neck, doing little or no injury. The surgeon who examined the wound, said he never knew or heard of such an escape.

Things that have an air of novelty and grandeur ; things that are of universal use, and recommended by the practice of great men will eternally please, not only because men are naturally inquisitive, but because they despise whatever is trivial or of little importance and are generally affected with what has the patronage of persons of high rank

What comes from the country, from little towns and obscure places, is but indifferently received. The mass falsely imagine that politeness and a good taste is not to be found there.

Phonographical Progress.

There are said to be some fifteen thousand persons in England, Ireland, and Scotland, who can read and use phonography with facility. Four phonographical journals are supported in England alone. In the United States there are three journals devoted to this reform, and some 8,000 persons who can read readily according to sound as well as letter.

This spelling according to sound is a mighty queer way, of improving the English language. Ague in the East, and Agur in the West, mean the same thing, yet the sound is the substance according to phonography, which by the by is a short science with a mighty long handle to spell it.

Antidote to Arsenic.

A child at Monteville, near Rouen, not long since swallowed a few pinches of arsenic, thinking it to be flour. It was soon seized with dreadful convulsions, and little hope was entertained of saving its life, when a physician administered hydrated peroxide of iron, which immediately overcame the effects of the poison.

A Red Hot Magnet.

The Zanesville Courier, states that a flash of lightning visited the telegraph office of that place, passing through a magnet, heating it almost red hot, and then off on a very small spiral wire used as a spring. Melting this, the fluid went out of an open window in front.

A Rogue Watch.

A new kind of machine, called an "idolator," is used in Leicester jail, Eng., for the employment of rogues and vagabonds, committed to hard labor; and it is said to be much dreaded by them, as it accurately registers the amount of labor performed, and is susceptible of exact adaptation to the bodily strength of the person who works it.

Sugar in Cuba.

Letters from Cuba state that there has not been a drop of rain on the north side of that island for four months. The sugar cane crop was coming on badly, and the young rattoons for next crop were looking very sickly.

Not Alone.

Man, says an elegant writer, can enjoy nothing to effect alone. Some one must lean on his arm; listen to his observations ; point out secret beauties, and become as it were, a partner in his feelings, or his impressions are completely dull and spiritless. Pleasures are increased in proportion as they are participated: as roses inoculated by the process.

Afflictions sent by Providence, melt the constancy of the noble-minded, but confirm the obduracy of the vile. The same furnace that hardens clay, liquifies gold, and in the strong manifestations of divine power, Pharaoh found his punishment, but David his pardon.

Aeriolite stones are said to have fallen recently in the vicinity of Cincinnati, Ohio. The Buckeyes have had within a few weeks a small earthquake, an aurora borealis, and this shower of meteoric stones. What can be coming next?

One of our exchanges in the South west attributes the recent low water at Niagara, to an accumulation of ice at Lockport. Our friend Turner will open his eyes at this news.

A poor fellow in Mexico was shot for threatening the life of his captain. As he threatened the life of his captain, some body should have threatened his life, and the account would have been squared.

The Niagara, a new and splendid Steamer has been driven ashore, and wrecked at the mouth of the Genesee River, Lake Ontario. Passengers and crew saved.

The Washington took out to England $200,000 in specie and the Hibernia $458,975.—That's the way the money goes.

Mr. Williams of St. Louis, Mo. is about erecting a manufactory for water rotting and cleaning hemp by a new and cheap process.

Saveral shocks of an earthquake have been felt in some districts of Ohio.

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For the Scientific American.

Clarke and Varley's Atmospheric Rail-Road.

So far as the Atmospheric Railroad system has been tried, it has not been able to compete with steam, neither as it regards certainty or speed. Whether some difficulties that are in the way now of atmospheric propulsion can yet be removed time and experiment will alone decide. There is much about the system, however, which will no doubt be interesting to many. The exhausting of the tubes, the closing and opening of the pneumatic valves, have been serious impediments in the way of success on account of friction and complexity. The tubes are exhausted and filled by stationary engines, one advantage at least. The tube, or pipe, in which the exhaustion takes place, is constructed of sheet iron, rolled to a proper thickness, drawn into proper lengths, and of the requisite width, to answer the intended diameter; these sheets are then formed into tubes in the usual way, and drawn through dies, to render them truly cylindrical—a shape which induces a tendency to close, in consequence of the elasticity of the material—so that the edges, which are truly planed, come together with a slight degree of force and form a perfectly air-tight coincidence; and when the tube is thus completed, the attachments for opening it are rivetted on. In laying down a line of tubing, the ends of each piece are merely made to abut against those adjacent to it, having a slip of vulcanised India rubber, cemented over each joint, about 2½ inches wide and one-eighth of an inch in thickness, and over this a band or strap of thin sheet iron is firmly keyed to the tube; the whole is then supported at the joints upon upright bearers, fixed in cast iron chairs, which chairs are screwed to the horizontal sleepers on which the rails are laid, and the upper ends of these uprights are fixed to the thin slip or strap already mentioned, one on each side at the middle of the tube. Along the whole range of the line of railway are placed longitudinal bars of malleable iron one on each side, which bars are supported on horizontal transverse rods, fixed on the top of the tube. A framework is fixed to the leading carriage of a train, in which two pair of horizontal wheels revolve in contact two and two—one pair before and another behind the coulter or connecting plate—by which the motion is communicated to the train; this is a steel plate half an inch in thickness, and of a width sufficient to confer fully competent strength for carrying on the heaviest train that may ever be attached to it. The horizontal wheels just mentioned, are of such a diameter that when between the bars they force them open, and consequently open the tube to the same extent, and admit the connecting plate to pass along without friction, as the opening thus effected is greater than the thickness of the plate; and the elasticity or spring of the tube has a tendency to bring its edges together behind and counteract the force required to open or extend the distance between the longitudinal bars in front, which opening is effected by a compound rolling motion, thus almost completely neutralising the effect of friction in producing the transit.—The tube is supported about 2 inches from the ground; and thus admitting every part of it to be got at for painting, and effecting other necessary alterations and repairs. The longer the tube is in use, the more perfect will the coincident edges become; and if, by any accident, a section of the tube should be damaged or deranged, it could be replaced or adjusted in a very short space of time. The plan was tested on an experimental line of 300 feet in length, and with a tube of 15 inches in diameter, laid down near the Poplar station of the London and Blackwall Railway, and it was found that the edges of the longitudinal slit came into sufficiently close contact to render the tube perfectly air-tight, so as to admit of its exhaustion to any required degree by means of the air pump. The results of the pneumatic system of railway, however, are not yet equal to steam, while the expense attending the system is much greater.

ENGINEER.

It is not to be expected that conversation should be always alike: since it depends upon chance, as well as other things.

American Porcelain.

A vast amount of money is expended every year for French and English china. Thousands upon thousands of dollars are sent to foreign houses for this single article alone—once fit only for the lordly hall, but now coveted and claimed, although at much expense, as a special adornment for the mechanic and farmer's table as well as that of the noble and gay, and why not? We think the classes referred to have the best right to such things, and in our country they will yet, we have no doubt, enjoy all the varieties of the wares of Dresden and Staffordshire without paying one half the price for them which they now do.

The natural material for the cheap manufacture of these wares is the first thing to be sought after and obtained—where this is wanting there can be no inducement to commence the manufacture. Happily for the United States there is an abundance of material for this purpose of the very first quality, and the capital, skill and enterprise are only wanted to establish and manufacture at once those beautiful productions first known in China, but for which France, Saxony and England are now justly famed in manufacturing.

In the State of Missouri late discoveries have brought to light an abundance of the most beautiful plastic clays. A Mr. E. Woodford of Caledonia, Washington county, Mo., has not only explored the regions around him and discovered plenty of excellent materials, but he has also made some fine specimens of different kinds of ware. He says that there is a bed of pipe clay near the Mammoth Lead Mine, on Big River; it is white in appearance, and polishes with the pressure of the fingers; it emits a strong odor when breathed upon, and contains some iron in the form of protoxide, which would render it unfit for the manufacture of good pottery. Pipe clay has also been discovered in the Richwoods, about ten miles west of the Mammoth Lead Mine; it is a bluish white, less plastic than that just mentioned, polishes with the pressure of the fingers, and emits very little odor when breathed upon. It becomes very white in the porcelain kiln, and is tolerably well adapted to the manufacture of Liverpool or delf ware. There is another location of clay about nine miles from Caledonia, which has good qualities and is free from iron. This is a desirable quality because the greater the portion of silex that is used, the whiter will be the ware. This clay is well adapted to the manufacture of granite or common ware.

On the south side of the Ozark mountains there are large deposites of Kaolin, also in St. Genevieve Co. It has a slight yellow color and remains unaltered in the porcelain kiln, except in the change of color, and becomes very white; it is also adapted to the manufacture of porcelain. Near the Kaolin are also found large blocks of glossy felspar, which is mostly of a flesh color, but some nearly white. It is well adapted to the manufacture of bodies and glazes of porcelain ware. There is also another kind of mineral which resembles a pot-stone or meerschaum Some specimens have been analyzed, and found to contain two parts of very fine silex, and one of alumine, one atom of iron, and a small portion of magnesia. Its external appearance is of a light yellow color; it emits no odor when breathed upon; when immersed in water, it falls down quickly into powder, and becomes a beautiful deep yellow. It stands the heat of the porcelain kiln without any contraction in its bulk, and becomes a beautiful light rose red; but when mixed with twelve per cent of felspar, it becomes very white and fine grained, and is as hard as the French china, possesses considerable transparency and admits of a shining glaze. There are large blocks of glassy felspar near Caledonia, of a flesh color, and some nearly white; it contains at least from six to eight per cent of potash, and is well adapted to the manufacture of pottery glazes. Here is also a bluish white flint, nearly pure silex. It is well adapted to the formation of bodies and glazes of pottery. In the vicinity of Caledonia there is a bed of fire clay, well adapted to the manufacture of fire bricks, and the formation of saggers for baking China. Thus Missouri possesses all the natural elements for making china, as good as that of any other country.

Terrestrial Magnetism.

It is well known that as we descend into the depths of the earth the temperature increases. This has led some philosophers to adopt the opinion that the centre of the earth is a mass of fire, a sea where fiery waves of lava dashed continually up against the sides of the rocky crust upon which we live and move. Whatever may be the cause of the central heat of the earth, the fact of the heat is undisputed. This has led to much observation within the past few years, and has resulted in the accumulation of much that is both interesting and instructive. The greatest discoveries have been those in relation to magnetic currents, and it has been found that there are magnetic currents within the earth which are not lasting on the surface A chart of magnetic curves requires to be reconstructed every ten years. Halley was the first to attempt their delineation: and he threw out some ingenious speculations as to the cause of the variations, attributing them to the revolution of a magnet in the interior of the earth. The subject remained in abeyance until 1811, when Hansteen of Christiana investigated the phenomenon, and defined the variations of the curves, during a period of two hundred years, with geometrical accuracy. In 1576, the needle stood eleven degrees east of north, from which point it returned until 1657-62, when it was due north. Continuing its march, the maximum of westerly declination, 27 degrees was reached in 1815, since which period it has again been moving slowly to the east. Hansteen supposed the existence of two magnetic poles at each of the polar points of the earth, to whose revolutions the variations of the compass, and of the magnetic curves were to be ascribed; but this has been shown to be untenable. The labors of Faraday, have gone far to divest the subject of many of its difficulties The relation of magnetism to all matter, is pregnant with important results towards a solution of the mystery: the objection that it was physically impossible for the earth to be a magnet, is now effectually set aside. Gauss of Gottingen, to whom this branch of science is so deeply indebted, computes the magnetic power of each cubic yard of the earth as equal to that of six steel magnets each of one pound weight. With so tremendous a power, vitalizing, so to speak, every inch of the globe, we are enabled to account for the upheavals, and other disturbances by which it is visited.

The researches of Napier and Crosse have demonstrated that minerals whether earthy or metallic, and crystals can be produced by weak electric currents; and it is a remarkable fact, that electric currents are found to exist in mines. Mr. R. W. Fox, has shown in his communications to the Philosophical Transactions, and other scientific publications that in the lead and copper mines of England, the direction of the positive currents is generally from east to west—subject, however, to local influences, by which they are sent in the opposite direction, or north and south, where the lodes are parallel. So certain were the indications of the galvanometer in detecting the presence of metallic substances or solutions, that the miners exclaimed, "The little thing knows ore, but dosen't know the country;" the latter part of the observations referring to the absence of movement in the needle when the instrument was applied to non-metallic rocks or earths, Mr. Fox succeeded in magnetizing an iron bar, and in one case obtained an electrotype plate by the action of these currents. By the same agency he has converted copper pyrites into vitereous copper; and produced artificial veins of carbonate of copper and zinc "in a wall of clay placed between the poles of a galvanic series. It appears to be highly probable," he adds, "that the metalliferous veins, and perhaps even the rocks themselves, impregnated as they are with different mineral waters, and thereby rendered imperfect conductors, if not exciters of electricity, may have an important influence in the economy of nature."

"Had you, sir," said Erskine to a dilatory tradesman, "have been employed to build the ark, we should not have had the flood yet."

Pemican, Food for Canadian Hunters.

The meat, which has been cut into thin flakes, and dried in the sun by the hunters, is conveyed to the establishment. It is there pounded in a mortar or by beating on an extended hide. The fat is boiled in a cauldron and skimmed of all impurities: an equal quantity of pounded meat is added to the fat, and the mixture is well stirred and poured hot into skin bags. It hardens in a few hours, and it is fit either for immediate use or to be kept for three or four years. There is a superior kind of pemican prepared from a mixture of equal weight of pounded meat, (tit bits,) marrow, fat, and blueberries. This forms a composition, resembling in appearance a rich plum pudding, which is very palatable, especially when recently made. As to the nourishing qualities of pemican it is almost unnecessary to give an opinion. Carbon for exhalation, fatty matter for nourishment, and nitrogenized matter for muscle are contained in abundance; but it is an unpleasant diet when taken *per se*.—*Life and Travels of Thomas Simpson.*

Ancient Gems.

The ancients wonderfully excelled in artistic talent, but yet not to surpass forever, as some cloister advocates assert, the skill of modern times. Still there is no doubt but they were acquainted with many arts now lost, or rediscovered. The discoveries in Herculania and Pompeii prove this. In coloring moulding and carving, the ancients excelled in a wonderful degree especially in ornamental work. They were great imitators of gems. A vase was preserved in a church, at Genoa, believed since the middle ages to be a pure emerald; declared by the priests to have been presented by the Queen of Sheba to Solomon, and to have been the very vase from which Christ drank at the wedding in Gallilee; held in such veneration that all were forbid to touch it on the penalty of death. This vase in the time of Bonaparte, was removed from the church in Genoa, to the museum in Paris, and there was subject to an examination, which proved it to be a false gem. It has since been returned to its place; but still it is, by the priests declared to be an emerald, and the vase presented to Solomon, and used by our Saviour The full beauty and perfection of many gems in the Museums of Italy, can only be seen by the aid of a glass, so that it seems the ancients must have had some acquaintance with the microscope.

A Wonderful Cure of a Broken Leg.

A sailor who had broken his leg was advised to communicate his case to the Royal Society. The account he gave was that having fallen from the top of the mast, and fractured his leg, he had dressed it with nothing but tar and oakum, and yet in three days was able to walk as well as before the accident The story at first appeared quite incredible, as no such efficacious qualities were known in tar, and still less in oakum; nor was a poor sailor to be credited on his own bare assertion of so wonderful a cure. The society very reasonably demanded a fuller relation, and the corroboration of evidence. Many doubted whether the leg had been really broken. That part of the story had been amply verified. Still it was difficult to believe that the man had made application of nothing but tar and oakum; and how they should cure a broken leg in three days, even if they could cure it at all; was a matter of the utmost wonder. Several letters passed between the society and the patient, who persevered in the most solemn asseverations of having used no other remedies, and it appeared beyond a doubt, that the man spoke true. It is a little uncharitable, but there are surgeons who might not like this abbreviation of attendance and expense, on the other hand many will admire the plain, honest simplicity of the sailor. In a postscript to his last letter, he added these words. "I forgot to tell your honors that the leg was a wooden one."

Mr. King the sculptor, has received an order for his bust of Mr. Adams, in marble, from the members of the House of Representatives. It is to be placed in the Speaker's Room.

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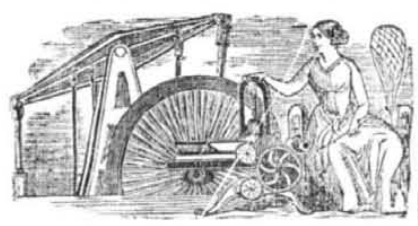


New Inventions.

Cotton Scraper.

A Mr. Byrd, of Greenwood, S. C., communicates to the Laurenville Herald the description of a Scraper now being employed in Mississippi, and which he represents to be the best instrument for the culture of cotton, on account of the saving of labor, ever yet known or used. The stock is made like the common ploughs of the country, with this exception, that it is much heavier, the root being 6 inches square at the end where the Scraper is fastened and the other parts in proportion. The Scraper is 9½ inches wide and about 14 inches long and laid with steel on the edge, ground sharp and fastened to the stock with a bolt or screw. When properly fixed a good ploughman can shave all the grass and dirt from the cotton and pile it in the middle of the row without breaking the bed, and the cotton is left in a beautiful ridge about three inches wide which will enable a hand with a hoe to chop out at least one half more in a day. The Scraper can be used in the second and third working of cotton to good advantage, but it must be recollected that as soon as the hoes have chopped out the grass that the earth must be thrown back with some suitable plough always. The stock is made heavy to make it run steady and to prevent it from being thrown out of its course easily. The Scraper is to be a substitute for the hoe and from experiment it has been found that it will save a great amount of manual labor, and more cotton produced. The dimensions of the Scraper are: foot 6 inches square at the lower end and 4½ feet long; beam 3½ feet from point to shoulder in helve; from lower point of beam, cut to secure Scraper 9 inches on the right hand side and 10½ on the left. The right hand side to be cut one inch and a half, and the left hand only half an inch. From point of Scraper to lower edge of beam perpendicular 14½ inches; give 2½ inches land. Three Scrapers are sufficient to cultivate 100 acres of land.

Freligh's Marine Mill.

At the late Fair of the Mechanics' Institute of St. Louis, Mo., held last week, among many other attractions, there was exhibited a model of Freligh's Marine Mill, which excited no little attention. We have noticed this mill before, but from what the St. Louis papers say regarding it, there is something exceedingly original both in its conception and construction. It is constructed in all its adaptations to accommodate its action to a floating foundation, however unsteady such a foundation may be, being hung and balanced upon the principle of the Mariner's Compass. The inventor is a practical miller and he solicited a fair examination of its merits at the Fair.—The plan is an improved mode of hanging the stones so as to obviate any motion of the boat throwing them out of working order, while the mill is kept industriously working away upon the hull. Mr. Freligh writes to us that the machinery for one of his Marine Mills that will grind an entire freight of wheat while running between St. Louis and New Orleans, additional to that of the machinery of the steamboat, will not exceed thirty tons. If it accomplishes this, it certainly is one of the most extraordinary inventions of the age.

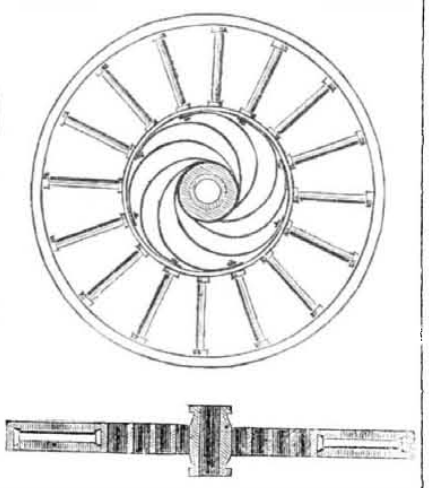
A Whale Propeller.

A Mr J. Reeder, of St Louis has invented a kind of aquatic steamer, which has been tried on Chateau's Pond, near that city, to the surprise of its citizens. The invention consists in the application to the stern of a boat, of a propeller shaped and fashioned like the tail of a whale. It consists of a combination of springs, which are operated upon by a crank, and which produces the same effect on the water, as does the tail of the whale. The whole idea seems to be borrowed from the form and powers of the whale to travel through the water. It is steered by small rudders (corresponding to the side fins on the fish.) The small craft upon which it has been applied glided through the water at a rapid rate, and the inventor believes that a vessel constructed on his principle may be made to cross the Atlantic from New York to Liverpool, in four or five days A belief which we think will fail ever to be realized. Machinery that will operate well in smooth water has altogether a different foe to encounter in the ocean wave and tempest.

Improvement in Spinning Rollers.

A patent was secured in England not long since, for a new method of covering rollers to be used in spinning cotton, silk waste and flax so as to prevent "licking," as it is technically termed. The roller is constructed as usual by covering the iron with a wooden cloth and afterwards with a layer of leather Two coats of japan varnish are then laid on, (oil japan.) The one coat is dried before the other is put on. Linen cloth will answer about as well as the leather covering but it should be run through the varnish, squeezed out and put on, afterwards when it is dry, get a coating with a brush and dried again.—Cotton felt too is about as good as leather for the rollers, if treated in the manner described, as the varnish prevents the humidity of the atmosphere, especially on ground floors, from acting on the rollers. The advantages of the varnish is elasticity and imperviousness to oil and dampness.

An Elastic Wheel.



This is the design of an elastic wheel for carriages, and the same principle can be applied to those for railroads. The nave is not situated in a fixed manner in the centre as usual, but is moveable in all directions in the plane of the wheel. It is supported and surrounded by eight semi-circular steel springs which at one end are fixed in it in suitable encasing, and at the other end in the circumference of an iron circle, which occupies the middle part of the wheels. Those springs supersede the usual ones that are inserted between the body of the carriage and the axles. The two figures above represent their application to carriages. The naves are made of cast iron and the other parts may be made of wrought iron.

The advantages claimed for this kind of wheel is its elasticity in all directions giving it equality of motion, economy of tractive power, and ease to passengers. It is also supposed to supersede the carriage spring in some measure, and it presents at least simplicity of construction and an elegance of shape. The nature of the elastic wheel is to depress the centre of gravity of the carriage according to the centre or axis of rotation giving it greater facility of motion and preventing vibratory movement, and thus affording greater security against overthrow from rough roads.

Explosion of Steam Boilers.

A writer in the National Intelligencer, in an article on the explosion of steam boilers, suggests the following plan for giving warning of any deficiency of water in the boilers.

"It consists simply of a leaden plug placed in such a position as to be covered with water, and at the same time subject to the action of the fire. So long as the water remains above the plug, no danger is to be apprehended, but when by accident, or carelessness the water falls below the plug, it at once melts, leaving an orifice in the boiler for the escape of the steam. It is not my wish to call attention to any particular method for preventing these terrible accidents. I only wish to make the danger more apparent. But the method above proposed appears to me to be the simplest and most effective one I have ever yet heard of."

[The writer of the above is evidently not aware that Evans's Safety Guard has been patented, and that it is a fusible alloy.—Ed.

Improved Brace Pad.

Fig. 1. Fig. 2.

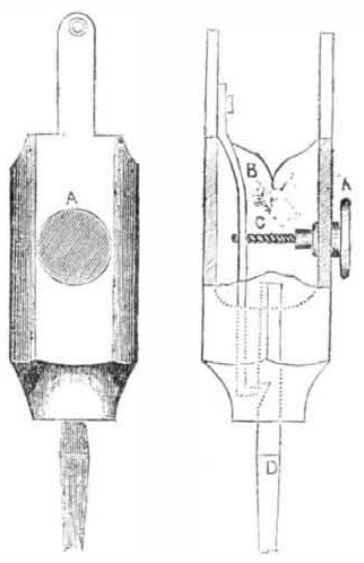


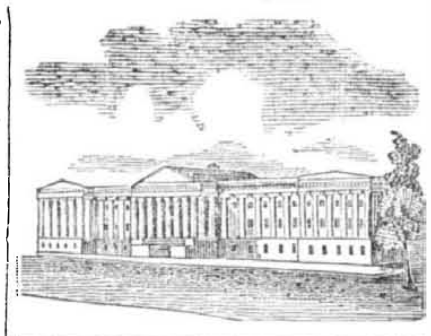
Fig. 1, is a view of the brace pad, showing the thumb bit in front. Fig. 2, is a side view In the ordinary brace pad the thumb bit is a small stud having a rod or arm connected with a projection on the spring. In the improved brace pad the thumb bit is made in the form represented above, and is tapped so as to allow one end of the screw, C, to enter it. The screw is attached at its other end to the spring B, so that on pressing the thumb bit, the bit D, is released from the spring catch, and may be withdrawn. In this improvement the form given to the thumb bit affords a greater surface for the thumb to press upon than the common brace pads, and the removal of the bit is effected with more ease. We have in view a number of engravings and interesting articles, for Carpenters, and Wood workers, which will be published from time to time in the Scientific American. Subscribers and others will also oblige us by sending communications relative to improvements in this branch of the mechanical trades, which may come under their notice

Discharge of Water.

The theoretical law for determining the quantity of water discharged from an orifice, and which is that "*the quantity discharged in each second may be obtained by multiplying the velocity by the area of the aperture*," is not found to hold good in practice a disturbance arising from the friction against the aperture, and from the formation of what is designated,

The Contracted Vein.

When water flows through a circular aperture in a plate the diameter of the issuing stream is contracted, and reaches its minimum dimensions at a distance about equal to that of half the diameter of the aperture as at *o o*, in the engraving. This effect arises from the circumstance that the flowing water is not alone that which is situated perpendicularly above the orifice, but the lateral portions likewise move. These, therefore, going in oblique directions, make the stream depart from the cylindrical form, and contract it as above described By the attachment of tubes of suitable shapes to the aperture, this effect may be avoided, and the quantity of flowing water very greatly increased. A simple aperture and such a tube being compared together, the latter was found to discharge half as much more water in the same space of time.



LIST OF PATENTS

ISSUED FROM THE UNITED STATES PATENT OFFICE,

For the week ending April 18, 1848.

To Lucius Stebbins, of Hartford, Conn., for improvement in operating Brakes for Cars.—Patented April 18, 1848. Ante-dated Oct. 18, 1847.

To Ezekiel B. Foster, of the Northern Liberties, Penn., for improvement in Plates for Stencilling. Patented April 18, 1848.

To Jules Porie, of New Orleans, La., for improvement in Filters. Patented April 18, 1848.

To Manoah Alden, of Ralston, Penn, for improvement in Blowers for Furnaces. Patented April 18, 1848.

To Isaac Woodcock, of Worcester, Mass., for improvement in hanging bodies of two wheeled Carriages. Patented April 18, 1848.

To Lucius Evans, of Fayetteville, N. Y., for improvement in Springs for closing Doors. Patented April 18, 1848.

To James S. Grimes, of Lansingburgh, N. Y. for improvement in combining Lanterns and Lamps. Patented April 18, 1848.

To Elias Knaus, of Valley Forge, Penn., and Samuel Beaver, jr. of Great Valley, Penn. for improvement in Grain Driers. Patented April 18, 1848.

To James R. Stafford, of Cleveland, Ohio, for three improvements in Grain Driers. Patented April 18, 1848.

To David Boardman, of Mount Vernon, N. H. for improvement in Organ Pipes. Patented April 18, 1848.

To Lemuel T. Talbot, of Taunton, Mass., for improvement in Hinges for sustaining, opening, closing and fastening window blinds. Patented April 18, 1848.

RE-ISSUES.

To Timothy D. Jackson and Alfred Judson, of Rochester, N. Y. (Judson assigner to Jackson and Jackson assigner to Jacob V. D. Wykoff, of New York City,) for improvement in Bell Machinery for Hotels, &c. Patented Oct. 17, 1846. Re-issued April 18, 1848.

DESIGNS.

To Elijah P. Penniman, (assigner to William H. Cheney,) of Rochester, N. Y., for Design for Stoves. Patented April 18, 1848.

INVENTOR'S CLAIMS.

Bullet Making.

By George W. Campbell, of Belleville, N. J. Improvement in the manufacture of Bullets, &c. Patented 20th Nov. 1847. Claim.—I wish it to be understood that I do not claim as my invention an endless chain of moulds, as that has before been made; but what I do claim as my invention and desire to secure by Letters Patent, is an endless chain of sections or moulds passing over horizontal prisms or cylinders, substantially as specified, for making bullets and other castings, so that the sections of the moulds shall be forced open for the discharge of their contents by passing around said cylinders.

Window Sash Fasteners.

By James Haggart, of New York. Improvement in Window Sash Fasteners. Patented 20th Nov. 1847. Claim.—What I claim as original is the arm and catch in combination with the metallic rod and catches as herein described.

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NEW YORK, APRIL 29, 1848.

Congress and Inventors.

We some time since noticed that a Bill had passed the U. S. Senate authorising the increase of the scientific corps in the Patent Office, and raising the pay of the Examiners and their assistants. We thought that the passage of the bill there, was a certain indication of it becoming a law. But we have been disappointed, sadly disappointed. The bill instead of being in the prospective of becoming a law, has a fair prospect of being left to confer a bad name upon the character of our country as represented by the members of Congress. The bill passed the Senate granting a salary of $2500 to the principal Examiners and $1500 to their assistants. The House of Representatives cut down the salary of $2500 to the principal Examiners, to $2000, and sent it back to the Senate. The Senate changed the bill to its original shape and sent it back to the House, where it now lies. We can tell the members of the House that the country demands a speedy action and a liberal one upon this bill. We believe that the majority of them are not aware of the qualifications required for an Examiner nor the labor he has to perform. The duties of an Examiner are more arduous than an Ambassador's or a Cabinet Minister's, and their pay is not disbursed by a tax upon the nation, but paid by inventors. Now inventors are the very persons that desire the increase of salary and an increase of Examiners. We know something of their wants and wishes. Congress must not adjourn without passing the bill, unless they desire to be remembered with ill will. If Congress adjourns without passing the bill it will be exceedingly injurious to the character of the present House. The Patent Office is about ten months behind in examinations, and we say that it is a shame for our Representatives to act towards our inventors as they have done. Why did they seek to cut down the $2500 to $2000? They surely do not know that there are but few men in the country capable of filling the offices referred to. Our inventors have made our country what it is in greatness and in wealth. Had it been our lot to have given a vote on such a bill it would have been for the addition of $500 more, not a reduction, and we know that our vote would have met the wishes of all our inventors. We want the business that is now lying piled up in the Patent Office exterminated and the books posted up as soon as possible. Congress alone is to blame for the present state of the Office, and not thr Commissioner.

Invention.

A true invention consists in the attainment of some result by a new mechanical arrangement, or by a new process. The desire to attain a certain result by other means than any known, necessarily quickens and directs the attention of a reflective mind towards the accomplishment of the object desired. The man who can arrange and combine, has what Phrenologists call the organs of *constructiveness, order* and concentrativeness, is sure of bringing into existence some apparatus or machine for the accomplishment of some purpose on which his mind has been fixed. This is one kind of invention. There is another, viz. the removal of an evil or the eradication of a defect in the construction of a machine to the harmony of its operations, or the complexity of its parts. And what new machine has been without fault? The steam engine of 1848 in comparison with the steam engine of 1800, is as the most perfect chronometer, to the old wooden clock. We have seen an engine of twelve horse power doing more work and occupying only one-thirtieth the room of the old *rattler*, as we used to call one of the old wooden walking beam snorers. The second kind of invention in machinery relates more to pruning and arranging than to strong thinking creativeness. The latter kind of invention is more the *property* of the skilful practical man, the former belongs oftener to those of another class. Fulton was not a machinist, Arkwright was a barber. The former is like the reaper that cuts down the ripe harvest field—the latter gathereth up the golden sheafs and bringeth them into the granary with songs of rejoicing. The two kinds of inventors are alike important and necessary to the perfection of a machine—splendid is the genius of that man who like Whitney or Watts or Stephenson's, embraces the boldness of conception with the fastidiousness of correct execution. Such a mind is like the burning mirror of Archimides: upon whatever object it is directed, the original elements are soon resolved and the exact combination portrayed, or re-resolved, and the result looms up like the sketchings of Angelo, grand and majestic, or like the harmonious pictures of Raphael, lovely and sublime.

No discovery except it be the result of research in the attainment of some end or the removal of some impediment to accomplish a certain object, can be called an invention.—Without the research spoken of, great discoveries have indeed been made, but they were not inventions, they were happy accidents.—It is to the honor of inventors, however, especially mechanical inventors, that such happy accidents have been but few and far between. The majority of useful inventions, have been the fruit of ardent labor, close study and patient research. The golden fruit of such mental qualifications and application have not in all cases been plucked by the worthy inventors themselves. Many an inventor has died of a broken heart and been laid in the grave of the poor—no monumental stone to tell were reposes the inventor of the water wheel, or the wind mill. The names of many of the inventors of useful tools and machines are buried in oblivion, while the fruit of their genius will continue to enrich the world to the end of time. Yet it is a pleasure to know that many inventors have been highly rewarded. Firmly and honestly have we and will we advocate the rights of true inventors—would that we could rescue from oblivion the names of many who deserve monuments, but who slumber unknown in name, fame or country. What have not inventors done for the world, more especially during the last century? Some crude scholastics would fain rob the present age of its glory and demean it beneath the rude, though no doubt the grand discoveries of the ancient era. We now can almost behold the thought of man running along the suspended nerves of the telegraph and leaving the earth behind in the race. The steam engine travels like a thing of life over our roads and through our streets, "or mounting the ocean wave stately and grand." What in ancient invention can compare to this. Yet for all our grand discoveries—numerous though they be—more than five hundred patents being granted in our country in one year—the end of invention is not yet. We are not perfect and never will be, but if we wish to progress we must aim at nothing less, our mark must be a high one. He therefore who would wish to benefit himself and his fellow men by invention, must first conceive some valuable object to be attained and then study out the best plan to attain it, or if there is an impediment in the way of accomplishing a desirable object, study out the best and most economical way for its removal. With these views kept continually before the minds of our ingenious people, our great nation must steadily progress in discovery—while there is a single desire to be gratified there is room for invention.

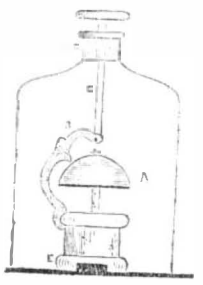
A Good Offer.

We have a communication now in our possession requesting a thorough practical and steady man to superintend the erection of a shot tower, and the manufacture of shot. Our correspondent has the best location for a shot tower in the State of New York, or in the world, and has capital to engage in the business. A partner acquainted with the business, would not be an objection. We can give more information to those who may desire it.

Mr. McTavish has lost his seat for Dundalk, in the British Parliament, in consequence of his being an American citizen by birth!

Phenomena of Sound.

When a thin elastic plate is made to vibrate one of its ends being held firm, and the other free, and its length limited to a few inches, it emits a clear and musical sound. If it be gradually lengthened, it yields notes of different characters, and finally all sound ceases, the vibrations becoming so slow that the eye can follow them without difficulty. This instructive experiment gives a clear insight into the nature of musical sounds, and, indeed, of all sounds generally. A substance which is executing a vibrating movement, provided the vibrations follow each other with sufficient rapidity, yields a musical sound, but when those vibrations fall below a certain rate, the ear can no longer distinguish the effect of their impulsions. The number of vibrations which such a plate makes in a given time depends upon its length, being inversely as the square of the length of the vibrating part. Thus if we take a plate and reduce its length, the vibrations will increase in rapidity; when half as long, it vibrates four times as fast: when one fourth, sixteen times, &c. all sounds arise in vibratory movements, and musical notes, differ from one another in the rapidity of their vibrations, the more rapid recurring or frequent the vibration, the higher the note. There is, therefore, no difficulty in determining how many vibrations are required, to produce any given note. We have merely to find the length of a plate which will yield the note in question, knowing previously what length is required to make a determinate number of vibrations in a given space of time. Thus it has been found that the ear can distinguish a sound made by 15 vibrations in a second, and can still continue to hear though the number reaches 48,000 per second. That all sounds arise in these pulsating movements, common observations abundantly prove. If we touch a bell, or the string of a piano, or prong of a tuning fork, we feel at once the vibratory motion, and with the cessation of that motion the sound dies away. But the pulsations of such a body are not above sufficient to produce the phenomena of sound. Media must intervene between them and the organ of hearing. In most cases the medium is atmospheric air, and when this is taken away the effect wholly ceases.



Under the receiver of an air pump, place a bell, the hammer of which can be removed by means of a lever, which is worked by a rod passing through the stuffing box. The bell is placed on a leather drum or cushion, this drum is necessary to prevent the transmission of the sound through the solid part of the pump, while the air is yet in the receiver the sound is quite audible, but on exhausting it becomes fainter and fainter, and at last can no longer be heard. On readmitting the air, the sound gradually increases, and soon acquires its original intensity. The sounding body therefore requires a soniferous medium to propagate its impulses to the ear. Air is far from being the only soniferous medium. Sounds pass with facility through water. The scratching of a pin, or the ticking of a watch, may be heard if applied to the end of a very long log or plank of wood. Any uniform elastic medium is capable of transmitting sound; but bodies which are imperfectly elastic, or have not an uniform density, impair its passage to a corresponding degree.

(*To be Continued.*)

Ballard Vale Machine Shop.

There is a machine shop at Ballard Vale, Mass., which is a model of an establishment. They are going to build engines and all kinds of machinery and castings. Files are to be made by power, and the whole is sealed with a sign of success, for there is a reading room attached to the works, supplied with papers and periodicals for the use of those employed.

Important Patent Case.

On the 14th inst. a case for infringement of Woodworth's patent, was decided in the Circuit Court of the United States at Boston, Justice Woodbury presiding. The contending parties were Woodworth *vs.* Edwards, and the action was brought for the first of the claim of Woodworth's patent for planeing, tongueing and grooving boards and plank.

The defendant was using a machine for planeing, under a patent granted to Benjamin Brown, of Burlington, Vermont, dated Oct. 21, 1845. The defence set up in addition to the patent granted to Brown, was that the patent granted to Woodworth in 1828, was not valid. 1st. On the ground of priority of invention. 2d. That in obtaining an extension of the patent on the 16th of November, 1842, a fraud was practiced. 3d. That a further extension granted by Congress on the 26th February, 1846, had also been obtained by fraud. 4th. That the patent having been surrendered on account of a defective specification, that a fraud had been perpetrated on the Commissioner of Patents, and that he had been induced by collusion to re-issue a patent with an amended specification for a different invention, including pressure rollers, and 5th, that Hale, Hill, Bentham, Muir, Smith and Emmons in 1824 and 1829, had put in operation substantially such a machine as the one claimed by the plaintiff.

The presiding Justice we have been informed, charged the Jury that the patent granted was already decided by the Supreme Court, and that they had nothing to decide upon but whether there was an infringement or not.

The case was seventeen days on trial, and the Jury rendered a verdict for plaintiff of $580, and costs.

Patent Infringement.—Reaction Water Wheel.

We have been informed that a case of infringement of a patent was tried at the December term of the United States Circuit Court at Springfield, Illinois. Suit was brought by Zebulon Parker against Charles Atkinson and others of Illinois, for making one Compound Percussion and Reaction Water Wheel, by placing eight of T. Roses's reaction wheels upon one horizontal shaft and applying the water to it with a vertical or circular motion by means of concentric cylinders enclosing the shaft, and for using the same some six months. The verdict of the jury in the case was for plaintiff and assessed the damages at two hundred dollars and costs.

Notice.

See article on the Economy of Power in Cotton Factories, on the next page.

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For the Scientific American.

Economy of Power in Cotton Factories.

(*Continued from our last.*)

As there is no particular necessity in planning a mill, for having the shafting revolve in one *direction* rather than another, the one that avoids the greatest number of *cross* belts is to be preferred. Such belts consume a large quantity of power by the constant rubbing of the crossing parts, and at the same time acquire a smooth polished surface in consequence of which they slip on the drum or pulley, unless tight enough to hug it with a *bear-like* grip, occasioning quadruple the strain in performing work that might be done by an open belt without slacking. Even open belts become smooth and slip on the pulley if allowed to run a certain length of time without the application of some oleaginous substance to their surface. Neatsfoot oil is generally used for this purpose; its effect however, is not very durable unless in combination with some other unctuous substance of greater consistence. A preparation consisting of 2 parts common tallow, 1 part bayberry tallow, and 1 part beeswax has been satisfactorily used.—The ingredients are boiled together until well incorporated, and applied with a brush while boiling. To enable the composition to penetrate every pore of the leather, the belt is afterwards drawn over a hot furnace. A thin coat of the same applied at the end of every six months will keep the belt in good order, and tear ordinary leather before it will slip on the pullies. It is customary in some mills to turn large drums into a convex shape for the purpose (as is supposed) of keeping the belt in its place while running, but there is no more propriety in doing this, than there would be in forming the teeth of geers like the arc of a circle instead of a straight line; for in both instances no more of the *central* parts would be in contact than is necessary under any circumstances, while the extremities being only slightly in contact, an undue proportion of the strain would be thrown upon the former. When the belts are properly made, the pullies set exactly opposite each other, and the shafting perfectly level, there is no reason why the belt should not run true on the pulley. Still should it from any cause incline to run off, it would be much better to keep it on by a guide or shipper than to round the pullies in the centre.

Machine makers have generally endeavored to have their millwright department keep pace with the improvement in the others. Indeed some *excel* in the former while they are not behind in the latter The elegant shafting made by the Matteawan Co. of Dutchess county, as seen in operation in the Newburgh Steam Mills of Orange county, compared with that in their own factories (20 to 30 years old) present as striking a contrast as would the aerial gyrations of Fanny Ellsler, beside the unwieldly dance of the hippopotamus.

The shafts and couplings should be turned in a lathe till every part of their circumference is at equal distances from the centre of motion, otherwise a tremor will be communicated to the whole line if run at a high speed which besides consuming much extra power, constantly tends to throw it out of place, and precludes the possibility of making perfect work on the machinery it drives.

A line of shafting can be made to run much lighter when the journals are not turned down smaller than the diameter of the shaft. In a range of any considerable length it is almost impossible to turn every journal so that its shoulder will exactly fit the bearing; and if this could be done, whenever any accident happened, to throw it out of line every journal would be liable to "heat." The same difficulty is not experienced when the shafts and journals are of equal diameters, and collars fitted with set screws are used to keep them in their place. The latter has the further advantage of greater convenience when it is necessary to take down a length of shafting some distance from the end. With the former plan, every separate shaft would have to be taken down, until the *particular* one was reached, but by the other it is only necessary to loosen the collars and the whole line can be moved until the coupling on the length to be taken down is detached from its mate.—This convenience is of obvious importance to a practical manufacturer, who in changing his style of goods often finds it necessary to alter the speed of different machines.

W. Montgomery.

(*To be continued.*)

For the Scientific American,

Guns.

Perkins' Steam Guns at one period set all the world on tiptoe as something that would annihilate the use of gunpowder, for military operations at least. They were to throw a far greater number of balls in a given time than could be done by powder, owing to the duration or uniformity of the propelling power. Experiment, however, soon settled the matter and it was found that the expensive and cumbrous apparatus was not only more expensive and cumbrous than common guns and powder, but also were projected with less force according to the means used than by gunpowder. For large shot especially, the steam gun was an entire failure. Pneumatic guns have likewise been tried and that but a short time ago, in one of our national vessels in our own Bay, but when the bow and arrow becomes a match for the musket, then will steam guns, air guns and mechanical percussion guns, equal or surpass powder as an explosive material to project balls from guns or muskets.

R. G.

Experiments in Gunnery.

We have always taken it for granted that guns were positively certain of exploding if the bullet was not *rammed home.* Our old philosophy has been all (perhaps only for a brief space) battered down by late experiments of Capt. Stockton, R. N. (Republican Navy,) just published in a pamphlet. The experiments were instituted by permission of the Navy Department, and the results have been to establish the converse proposition, of a space left *between the powder and ball* in a gun makes it liable to burst in a greater degree than if the ball was rammed down upon the powder. With one set of guns there was the following result. With the shot rammed home, from the mean of three experiments, the bursting charge was 6 2-3 ounces; with space of two inches, bursting charge 8 ounces; with space of four inches, 7 3-4 ounces, and with space of six inches 9 3-4 ounces.—The guns always burst with a smaller charge when the ball was nearer the powder than when it was at a distance. The range or distance to which the ball was thrown horizontally, before striking the ground, was greater in all cases where the shot was down on the powder than in those in which a space was left between, also when the shot was in contact with the powder, the recoil was less than when the shot was rammed home. From the results it therefore appears that so far from increasing the tendency of a gun to burst by leaving a space between the ball and the powder, the danger is considerably diminished by such an arrangement.

In relation to what is the effect in reference to the tendency of bursting, by increasing the number of shot to be fired from the gun at the same discharge, the experiments proved that one gun charged with a single ball in contact with the powder burst with a charge of 6 2-3 ounces, one gun with four balls, all home, 3 3-4 ounces; nine balls, all home, 3 1-4 ounces. From another set of guns of greater tenacity of metal, one burst without shot, with 16 ounces, with one ball in contact with the powder, 9 1-4; another with one ball in contact, 8 1-4; two balls sent home, 6 1-4 ounces; five balls, all home, 4 ounces. These bursting charges prove that with a constant pressure, the time required to move a weight through a given distance, is as the squre root of the weight.

Captain Stockton also proved that the part of the gun subjected to the greatest internal pressure was that occupied by the powder.—All these experiments are opposite to common opinions upon this subject.

Enormous Bird.

Mr. Henderson has discovered in New Siberia, the claws of a bird, measuring each a yard in length; and the Yakuts assured him they had frequently in their hunting excursions, met with skeletons, and even feathers of this bird, the quills of which were large enough to admit a man's arm.

Crystallization.

Substances which pass from the liquid to a solid state, usually form regular geometrical forms. And this symmetrical arrangement of the particles, or crystallization, is, therefore, not the result of accident, but of certain arranging forces, which operate with perfect regularity, and depend upon the chemical nature of the substance itself. The general laws which the forces obey, and the circumstances which modify their action, are important facts not only to theoretical science, but to all branches of industry, the successful results of which depend upon the proper formation of crystalline bodies.

The more gently and slowly crystallization takes place, the larger and more perfect will be the crystals. If it occur rapidly, the crystals will therefore be very small and confused.

While repose causes crystallization to be both slow and regular, mechanical agitation accelerates it, but renders the crystals minute and irregular. Hence rock candy is made by allowing syrup slightly concentrated to evaporate gently in a stove, while fine-grained loaf sugar is the result of agitation and rapid solidification.

Foreign substances, especially those of a porous nature, encrust themselves with crystals, in crystallizing solutions. Hence the use of threads in the manufacture of rock candy, and similarly, the manufacturer of blue vitriol makes use of sticks, upon which the salt crystallizes and by which it is then readily removed.

Crystals already formed act even more energetically than porous bodies; and such is their influence, that we may obtain from a solution of two salts either one or the other, at pleasure, by immersing a crystal of the salt we wish to separate. If for instance, we dissolve two parts of nitre, and three of sulphate of soda in five of warm water, and pour the solution into two flasks, filling them each: then if we put a crystal of nitre, into one, and a crystal of sulphate of soda into the other, and place them both in a mixture of water, snd powdered ice, there will be formed in the one only crystals of nitre, and in the other only crystals of soda

Crystals of larger size and modified form may be made by the increase produced by immersion in saturated solutions; and large crystals will even grow at the expense of smaller ones in the same solution, if exposed to changes of temperature. When the temperature rises, the solution becomes stronger, by dissolving a portion of the crystals; but when it cools again the matter thus taken up will be deposited chiefly upon the large crystals, so that, after a while the smaller crystals will entirely disappear.

In solutions allowed to crystallize quietly, crystals form chiefly at the bottom, and not uniformly throughout the liquid. The reason for this is, that when the solid matter is deposited, the liquid which was combined with it is set free, and being of less density than the rest of the solution, it rises to the top, and gives place to another saturated portion, this, in turn, deposites part of its solid matter, and ascends as the former. If we look through a crystallizing solution, we may observe this ascending motion of the particles, and distinct currents rising from the larger crystals.

All crystals which form in aqueous solutions enclose a portion of the solution, or mother water, mechanically, between their molecules; if the solution contain other substances, this will render the crystals more or less impure. Hence it is often necessary to purify substances by repeated crystallization. The larger the crystals, the more of the mother-liquor will they thus absorb. For this reason, crude nitre, alum, and sugar, are purer, when, by rapid crystallization they have formed in small grains.

True Nobility.

Labor, industry, and virtue, go hand in hand. Idleness and leisure lead to wickedness, immorality and vice.—Down with all aristocracy—all nobility—save the nobility of true virtue and honest industry. Toil, either of the brain, the heart, or the hand, is the only true manhood, and the only true nobility.

Intemperance.

The cost of intoxicating drinks, consumed annually in the U. S. is variously estimated at from $50,000,000 to $150,000,000. Let us suppose it to be $75,000,000. That, on an average is more than $3 to each inhabitant. The bare interest of it would nearly cover the whole civil expenses of our Government. The whole sum would build such a city as Boston, and leave a surplus of some twenty millions. It would build 3,500 miles of Railroad at $30,000 per mile. It would build a College for every State, an academy for every county, and a school-house for every town in the county. The bare interest of it would support 3,000 Missionaries at a salary of $1,000 each per annum; and the same number of teachers at $500 each But it does no such things as these. It is expended to undermine health, to multiply diseases, to shorten life, to increase maniacs, and criminals and paupers, to nurture sorrow, to break hearts, to destroy intellects, and ruin souls. Words cannot tell its work; the eye is disgusted with horror, or blinded with tears, when it attempts to trace its deeds. These are the purposes of this waste.

Population of the British Empire.

The inhabitants of the United Kingdom, according to the returns made in 1845, numbered about 20,000,000. The colonists, subjects and tributaries, in the colonies and settlements belonging to the British Empire, amount to about 136,079,000, making together about 156,000,000.

There are only three European states with a population more numerous: Russia with 63 millions: Austria with 37 millions; and France with 35 millions. But taking the whole British Empire, it is certain that no other state in the world is peopled so extensively, excepting the Chinese; but that is doubtful because Chinese statistics are not to be depended upon. The British Empire is more than double the size of all Europe, and it is more than four times as populous as France—twice and a half as large as Russia; and amounts alone to as much as the population of Russia, Austria, France, Prussia, Spain, and Holland.

The whole human race is estimated at 800,000,000; the British Empire at 156,000,000; so that its population comprises upwards of one-fifth of the human race. The population tributary or subject to the British poople, numbers five times its own amount.

Wages of Labor.

For the laboring classes, the state of things in Britain is growing worse and worse every year, so says Robert Dale Owen. Some however, deny this and say that the English laborer is now more comfortable than ever, but the latter opinion is contradicted by all history. The real comforts, essentials of life, were more easily obtained by the working classes of England one hundred years ago than now. The reason of this is that wealth is steadily accumulating in fewer and fewer hands. In 1775 the soil of England was owned by 240,000 proprietors; in 1815, the number had decreased to 30,000, and is still diminishing, and only one person in 800 has any ownership in the soil. Of course pauperism is steadily on the increase.

New Lights on Astronomy.

A gentleman has been lecturing recently in Huddersfield, England, on Astronomy, and reaping a rich harvest at 2d per head. Among other extraordinary things, not having the fear of Sir Isaac Newton before his eyes, he asserts that this earth is not a planet or a globe, and that it does not revolve either on an axis or in an orbit, but that it is an extended plain, remaining at rest, and quotes Moses and Joshua in support of his theory. He also asserts that the sun is only fifty miles distant, and that neither it nor the moon and stars are bodies, but lights only; like Shelley's Newton,

"Those mighty stars that gem infinity,
Were only specks of tinsel; fixed in heaven
To light the midnights of his native town"

And yet he manages to invest these absurdities with a great deal of pomp and piety, and it is amusing to observe the effect he produces upon his stultified audience.

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TO CORRESPONDENTS.

"L. R. B. of Mass."—The best work on steel and iron manufacture is Holtzapffell's, price $10,50. On the speed of drums, see our last number. Your last question, regarding the corresponding speed to the cone of least diameter, was not clear enough. Whether was it, an increase of speed or decrease for the corresponding cone. If it was a proportional increase of speed in the same ratio as between 5 inch and 24, then the diameter of the new cone must be one inch and four-fifths, and the other diameters in the same proportion. The reason of this is that the 5 inch cone performs four and four-fifth revolutions for every revolution of the 24 inch cone. The medium diameter of cone for a decrease of speed would be 10 inches for the first diameter from 5.

"J. W. of R. I."—We shall attend to your request.

"D. W. of Vt."—Your papers and model have been forwarded to Washington.

"C. C. of Orange County."—We have answered you by mail.

"E. B. of Conn."—Will you be pleased to examine page 82 of Galloway's history of the steam engine and see if there is not a similar rotary engine to yours. It was the invention of Mr. Murdock in 1799.

"D. E. S. of N. Bridgewater."—You will have to send another minute description.

"R. R. of Geo."—We have endeavored to get you the information about Mr. Parkhurst's Burring machine but have not yet succeeded. A short time ago it was before the U. S. District Court here, and is not yet we believe settled.

"E. C. A. C. of Ill."—Next week your article will appear, could not before.

"R. V. J. of Ky."—See No. 30, vol. 2, Sci. American.

"J. M. of R. I."—Your request shall be fully attended to,—but it will be three weeks before it will all be complete, there is so much before yours, but this won't make much difference to you.

"G. T. of N. Y."—We have answered you by mail regarding your windlass.

"H. C. W. of Worcester."—Would you be pleased to forward again a minute description.

"P. P. of Va."—A glass plate of any thickness whatever, will have no effect in separating the three primitive colors. If you observe any prism you will perceive that the *chromatic scale* is a harmonious blending. This subject would require considerable space to discuss, more than we shall be able for some time to devote to it, but may yet do so.

"W. O. S. of Mass."—We have answered you by mail.

"S. R. of Pa."—Use a little oxalic acid with your Prussian blue. We cannot afford to give you a receipt of the fast blue for nothing, when we had to pay $20 to another person for it.

"J. K. P. of Pa."—We would advise you not to lose time and money any longer in trying to invent perpetual motion. Let experience and sound sense guide your inventive mind, not vague impossibilities.

"W. R. G. of N. Y."—We will answer you next week, also, F. C. W. of Ill.

W. W. of S. C."—The complete work of Ranlett's Architect will comprise 20 Nos. and the cost of the work complete is $10. There are 12 Nos. already out, and the others will be published on the first of each successive month. It is truly a valuable publication, and well worth the price.

"J. A. W. of Boston."—We have answered you by mail.

Holden's Dollar Magazine.

This monthly for May, is just laid upon our table, and it is a very superior number. This work increases in interest and evident ability. It is an enterprise of no ordinary kind. The dissertation on the writings of Longfellow is *written with a free hand*, and is worth the whole price of the number.

Union Magazine.

The May number of this popular periodical is splendid. The embellishments are numerous and beautiful, and the many original articles by the most popular writers of the day, renders it exceedingly interesting to all lovers of chaste and elegant literatnre.—Israel Post, Publisher, 140 Nassau St.

Manufacture of Tapestry, Rugs, &c.

We shall commence the publication of a series of articles on the Manufacture of Tapestry, Rugs, Carpets, &c. in our next paper, which will be highly interesting to all who are engaged in this important branch of manufactures The articles will be accompanied with engravings of machinery and are compiled with the greatest care by Mr. Gilroy, whose knowledge of the subject is practical.

Manufacture of Flax.

A company is about to commence the manufacture of flax at Northampton, Mass. They are ready to contract with farmers in that vicinity for the supply of the raw material. They will furnish seed to be returned after harvest, and will purchase the flax after being threshed, at $12 per ton. It is their intention to prepare the flax for spinning, to erect a mill with machinery, and to manufacture thread, twine, or whatever will meet with the demand in the market.

History of the Hat.

This is a neat illustrated little book, published by Genin, 214 Broadway. It describes as many different kinds of *chapeaus* as there are days in the year, and attributes the death of Absalom to the want of a hat.

Advice Gratis.

It gives us pleasure at all times to recommend things which we think will benefit our readers, and to the hat and cap wearing community, we do not know how we can give them better advice than to recommend them to call on neighbor Knox, whose extensive establishment is directly under our office and select a covering for the intellectual, and consequently most important part of the human system.

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To Mill Owners.

HAVILAND & TUTTLE'S Patent Centre Vent Pressure Water Wheel.—These wheels are now in successful operation in many towns in Maine, Massachusetts, and Rhode Island, and are found to surpass in power and facility of adaptation any water wheel now in use. This wheel was awarded the silver medal at the Fair of the American Institute recently held in New York and a diploma at the Mechanics' Fair in Boston.

The wheels are manufactured and for sale by the FULTON IRON FOUNDRY CO., South Boston, Mass.,—where the wheels can be seen and any information concerning them had.

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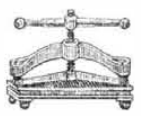

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Johnson's Improved Shingle Machine.

THE Subscriber having received Letter Patent for an improvement in the Shingle Machine, is now ready to furnish them at short notice, and he would request all those who want a good machine for sawing shingles, to call on him and examine the improvements he has made, as one eighth more shingles can be sawed in the same given time than by any other machine now in use.
Augusta, Maine, Oct. 1, 1847. J. G. JOHNSON.

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For the Scientific American.

Case Hardening.

The hardness and polish of steel may be united, in a certain degree, with the firmness and cheapness of malleable iron, by case-hardening, it is a superficial conversion of iron into steel.

The goods intended to be case-hardened, being previously finished, with the exception of polishing, are stratified with animal carbon, and the box containing them luted with equal parts of sand and clay. They are then placed in the fire, and kept at a light red heat for half an hour, when the contents of the box are emptied into water. Delicate articles, like files, may be preserved by a saturated solution of common salt, with any vegetable mucilage, to give it a pulpy consistence. The carbon is nothing more than any animal matter, such as horns, hoofs, skins, or leather, sufficiently burned to admit of being reduced to powder. The box is commonly made of iron, but the use of it, for occasional case-hardening upon a small scale, may easily be dispensed with, as it will answer the same end to envelope the articles with the composition above directed to be used as a lute, drying it gradually, before it is exposed to a red heat: otherwise it will probably crack. The depth of the steel induced by case-hardening, will vary with the time the operation is continued.

A very speedy and most excellent method of case-hardening, is effected by reducing some of the prussiate of potass to powder, and making it into paste, rubbing over the finished iron while it is at a red heat, and then putting it in the fire again, and plunging it into water when the iron is at a blood red heat. This may be repeated to insure a greater depth of hardening.

For the Scientific American.

Enamelling Iron Vessels.

Reduce into fine powder and grind together nine parts of red lead, six parts of flint glass, two parts of purified pearlash, two parts of purified saltpetre and one part of borax. This is put into a large crucible about half full and melted until a clear glass is obtained. This glass is then ground with water and the iron vessel is covered with a coating of it and then heated in a muffle in a furnace. This will melt in a very short time if the furnace is at a good heat and the iron vessel will be covered with a very fine black enamel of a shining appearance. To make it tough, it should be put into an annealing oven.

Another very fine enamel for iron vessels is made as follows: Twelve parts of flint glass, eighteen parts of red lead, four parts of pearlash, four parts of saltpetre, two parts of borax, three parts of the oxide of tin calcined with common salt, and one part of the calx of cobalt. This is treated the same as described above and it makes an enamel of a beautiful color. It is well adapted for enamelling iron basins and other vessels.

For the Scientific American.

Tempering Steel Rollers.

Great difficulty is often experienced by mechanics in the tempering of steel rollers, especially those used as dies—such as for silver-smithing, &c. In the tempering, the rollers frequently crack open from being suddenly plunged in cold water. The cause of this is practically the result of the rollers being heated to too high a temperature and by plunging the steel in that state into the water whereby oxygen is absorbed and the steel rent along its *grain* by explosion. To prevent this let the rollers be well polished and then covered with the dry powder of prussiate of potass and put them into the fire and bring them to a low red heat, then take them out, cover them with a paste of prussiate of potass and put them into the fire again until they are of a low red heat, when they are taken out and plunged into cold water, from whence they come out smooth as glass, perfectly hardened for every purpose and no danger of cracking or splitting open. This is case-hardening steel for a certain purpose. It is the result of many experiments and practically it never fails in the hands of those who have made this branch of business a part of their occupation.

The Horse Shoe Magnet.

This is the best form for a powerful magnet, curious though it may be. It was discovered by Professor Henry, now of the Smithson Institute, at the capital of our great Trans-atlantic Republic. Professor Henry and Mr. Ten Eyck constructed a horse shoe magnet weighing 60 lbs. which supported more than two thousand pounds.

The power of a magnet is estimated by the weight its poles are able to carry. Each pole singly is able to support a greater weight than when they both act together by means of a keeper and this is the reason why horse shoe magnets are superior to bar magnets of like dimensions. Small magnets lift more according to their weights than large ones. Sir Isaac Newton wore in a ring a magnet of only three grains in weight, yet it could lift two hundred and fifty times its own weight. Bar magnets of great size seldom are able to lift more than their own weight. Small horse shoe magnets of one ounce weight will lift thirty times their weight. Professor Henry's magnet was indeed a rare one.

To Describe an Oval.

Many instruments have been invented to describe an oval, yet no one of them has yet been able to supersede the practical guiding of the hand, by a correct eye for perspective drawing. The reason of this is, that some ovals are more eccentric than others, that is, if we consider all ellipses to be ovals, and it is the most simple method to do so. The expert draughtsman by making his four points describes his desired ellipsis by hand far quicker and more correct than by any machine in existence. A common way, however, to describe an oval is to set up two pins on the board and fix a thread around them and follow with the pencil keeping the thread taut. The thread must stretch to the point in width across the ellipsis. This plan describes a very correct oval.

Curious Experiment.

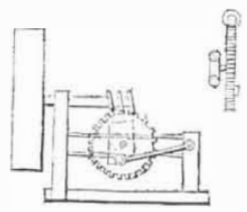
One of the most remarkable and inexplicable experiments relative to the strength of the human frame, is that with which a heavy man is raised with the greatest facility when he is lifted up the instant that his own lungs, and those of the persons who raise him, are inflated with air. Done in the following manner: The heaviest person in the party lies down in two chairs, his legs being supported by one, and his back by the other. Four persons, one at each leg and one at each shoulder, then try to raise him, and they find his dead weight to be very great, from the difficulty they experience in supporting him. When he is replaced in the chair, each of the four persons take hold of the body as before, and the person to be raised gives two signals by clapping his hands. At the first signal he and the four lifters begin to draw a long breath, and when the inhalation is completed, or the lungs filled, the second signal is given for raising the person on the chairs. To his own surprise, and that of his bearers, he rises with the greatest facility, as if he were no heavier than a feather.—*Brewster on Natural Mag.*

Singular Effects of Attraction.

In the Edinburg Journal of Sciences, just published, we find a very interesting paper, by Dr. Hancock, on the motions that result merely from mixing a few drops of alcohol with a small vial of laurel oil. To exhibit this singular phenomenon, which seems to bear some analogy with the planetary orbs, the drops of alcohol should be introduced at different intervals of time. A revolving or circular motion instantly commences in the oil, carrying the alcoholic globules through a series of mutual attractions and repulsions which will last for many days. The round bodies which seem to move with perfect freedom through the fluid, turn in a small eccentric curve at each extremity of their course, passing each other rapidly without touching. In the course of his experiments, Dr. Hancock observed particles of the fluid to separate in large globular portions, these commenced a similar revolution, and smaller ones quitted their course and revolved about the larger, while the latter still pursued their gyrations, after the manner of primary planets and their secondaries.

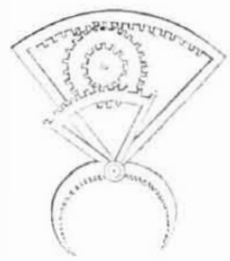
MECHANICAL MOVEMENTS.

Traversing Drum.



This cut represents a drum having a worm at the extremity of its axis which takes into a wheel freely supported by the two horizontal rods at the back, and connected at an eccentric point on its surface to the fast framing; by this arrangement the drum is traversed endways back and forth at every revolution of the wheel The right hand figure is a section of the wheel, shaft and rods.

Saw Mill Nipper.



This cut represents Nippers that have been and are still used in many places for holding the rough timber in Saw mills. It will easily be perceived that the action of the two wheels on the rack segments will close and open the nippers as may be desired.

Soap as a Manure.

T. Dalton, a silk dyer, says, in the London Agricultural Gazette, that he uses 15 cwt, of soap weekly, to discharge the oily matter from the silk, and forming of itself, a kind of soap, the whole of which yields from 4,000 to 6,000 gallons of strong soap suds per week. This he has lately applied to his farm, and "its effect is most extraordinary." It has been used only one season, and its results cannot be accurately given, but he considers it more powerful than any other manure: and he thinks if farmers were allowed the drawback of the duty on soap as manure, as manufacturers are, it would soon supersede guano.

New use of the Tomatoe.

The Cheraw Gazette states that in addition to the advantages of the tomato for table use, the vine is of great value as food for cattle, especially cows. It is said that a cow fed on Tomato vines, will give more milk, and yield butter of a finer flavor, and in greater abundance than any other long feed ever tried. It is thought, too, that more good food for cattle, and at less expense can be raised for cattle from a given quantity of ground planted in Tomatoes, than from any other vegetables known in the Southern country.

Farmers look out for this, in the coming season.

Hints to Ladies.

Stair carpets should never be put down without having a slip of paper put under them, at and over the edge of every stair, which is the part where they first wear out, in order to lessen the friction of the carpets against the boards beneath. The strips should be within an inch or two as long as the carpet is wide, and about four or five inches in breadth so as to lie a distance from each stair. This simple plan, so easy of execution, will, we know, preserve a stair carpet half as long again, as it would last without the strips of paper.

Scenting a Room.

Cologne, or any other liquid perfume made with essential oils, will scent a room much better and longer, if, instead, of sprinkling it about, you pour a few drops into a glass of water, and put it in some central place.

Economical White Paint.

Skim-milk two quarts; fresh slacked lime eight ounces; linseed oil 6 ounces; white Burgundy pitch two ounces; Spanish white three pounds. The lime to be slackened in water, exposed to the air, and mixed in about one-fourth of the milk; the oil in which the pitch is dissolved to be added a little at a time, then the rest of the milk, and afterwards the Spanish white. This quantity is sufficient for twenty-seven square yards, two coats, and the expense a mere trifle.

This paint should now be applied to all the outhouses of a farm. It will destroy many of the larvæ of insects deposited in the crevices of buildings.

To Prevent Cholera

Prevention is better than cure, and should diarahœa, which is a preceding symptom of cholera, attack any person, he should immediately seek a prompt cure. Calomel and opium are considered infallible in their action.—Twenty grains of calomel to two of opium is considered not to be too large a dose and to be repeated if necessary.

French Polish for Boots or Shoes.

Logwood chips, half a pound, glue, quarter of a pound; indigo, pounded very fine, quarter of an ounce; soft soap, quarter of an ounce; isinglass, quarter of an ounce. Boil these ingredients in two pints of vinegar and one of water during ten minutes after ebullition, then strain the liquid. When cold it is fit for use. To apply the French polish, the dirt must be cleaned from the boots or shoes; when these are quite dry, the liquid polish is put on with a bit of sponge.

To Clean and Restore the Elasticity of Cane Bottom Chairs, Couches, Etc.

Turn up the chair bottom, &c., and with warm water and a sponge wash the cane-work well, so that it becomes well soaked; should it be dirty you must add soap; let it dry in the air, and you will find it as tight and firm as when new, providing that the cane is not broken.

Tooth Powder.

Burn common hazel nuts in the fire till the flame is gone, and they are red hot; take them out, throw away the shell, and crush the kernel, which will then form an exceedingly fine charcoal tooth powder.

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